Betriebsanleitung • Operating Instructions

Recycled Water Cooling Unit

TZK 400

TZK 2000

PM 800 369 BE/F (0402)

PFEIFFER VACUUM

Index

Page

1. Safety Precautions 2
1.1. For Your Orientation 2
1.2. Pictogram Definitions 2

2. Understanding The Recycled Water Cooling Unit 3
2.1. Main Features 3
2.2. Differences Between The TZK 400 And TZK 2000 3
2.3. Scope Of Supply 3

3. Installation 4
3.1. Preparations For Installation 4
3.2. Fitting The Recycled Water Cooling Unit 4
3.3. Electrical Connections 4

4. Operations 5
4.1. Filling Up With Cooling Water 5
4.2. Setting The Cooling Temperature 5
4.3. Switching ON And OFF 5

Page

5. What To Do In Case Of Breakdowns? 5

6. Maintenance 6

7. Service 6

8. Technical Data 6
8.1. Dimensions 7

Declaration of Conformity ..... (last page)

Please note: Current operating instructions are available via www.pfeiffer-vacuum.de under "Infoservice".

1. Safety Precautions

☞ Read and follow all the instructions in this manual.
☞ Inform yourself regarding:
  – Hazards which can be caused by the unit;
  – Hazards which can arise in your system;
☞ Observe all safety and accident prevention regulations.
☞ Check regularly that all safety requirements are being complied with.
☞ Do not carry out any unauthorised conversions or modifications on the unit.
☞ When returning the unit to us please note the shipping instructions in Section 7.

1.2. For Your Orientation

Instuction in the text
➡ Working instruction: Here, you have to do something.

Symbols used
The following symbols are used throughout in the illustrations:

Cooling water connection

Electrical connection

Position numbers
Identical unit and accessory parts have the same position numbers in all illustrations.

1.1. Pictogram Definitions

Caution, danger of damage to the unit or system.

Warning, danger of personal injury.

Warning, danger of an electric shock.

Please note, attention to particulary important information on the product, handling the product or to a particular part of the documentation.

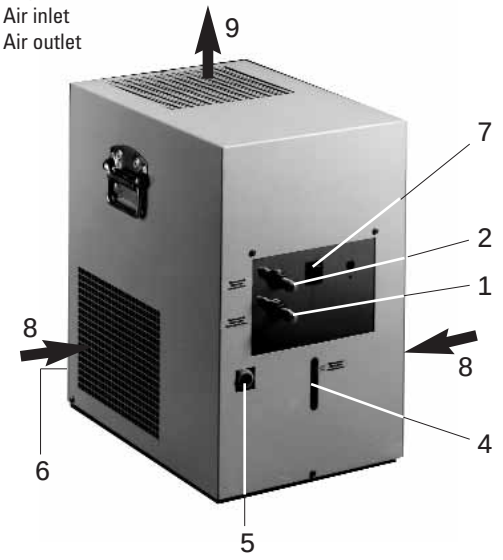
Modifications reserved.

2. Understanding The Recycled Water Cooling Unit

2.1. Main Features

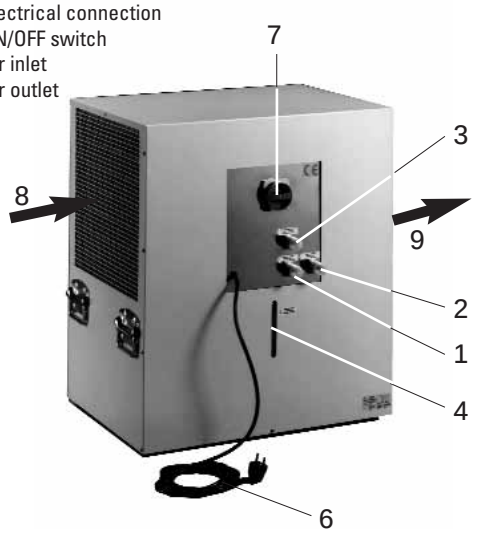
TZK 400

1 Water outlet
2 Water inlet / water filler port
4 Water level display
5 Overflow
6 Electrical connection
7 ON/OFF switch
8 Air inlet
9 Air outlet



TZK 2000

1 Water outlet
2 Water inlet
3 Water filler port
4 Water level display
5 Overflow
6 Electrical connection
7 ON/OFF switch
8 Air inlet
9 Air outlet



The air cooled recycled water cooling unit can be operated where ambient temperatures do not exceed 32 °C. Cooling performance is dependent on:

– The ambient temperature (the lower the temperature the greater the cooling performance).
– The temperature of the water at the outlet (with unchanged ambient temperature and reducing temperature of the water at the outlet, cooling per formance decreases).

Proper use

– The recycled water cooling unit may only be used to cool Pfeiffer Vacuum turbomolecular pumps.
– Using accessories not named in this manual is not permitted without authorisation from Pfeiffer Vacuum.

Improper use

Improper use includes, inter alia:

– Operating the recycled water cooling unit in mobile systems.
– Recycled water cooling at water temperatures > 25 °C and < 6 °C.
– Cooling objects with a surface temperature of > 80 °C.
– Any other use not described in "Proper Use" above.

Improper use will cause any rights regarding liability and guarantees to be forfeited.

2.2. Differences Between The TZK 400 And TZK 2000

Feature	TZK 400	TZK 2000
Dimensions (mm)	430 x 470 x 300	430 x 700 x 600
Weight, empty of water (kg)	30	71,5
Cooling performance at incoming water temperature of 20 °C and ambient temperature 24 °C (W)	540	1800

2.3. Scope Of Supply

TZK 400

Recycled Water Cooling Unit TZK 400 with a 2.5 meter long cable with mains plug. Supplied are:

– 3 m PVC-hose 10 x 16 and respective hose connections with threaded port 3/8" (two pieces).
– 3m PVC-hose 8 x 14 and respective hose connections with threaded port 3/8" (two pieces).

TZK 2000

Recycled Water Cooling Unit TZK 400 with a 2.5 meter long cable with mains plug. Supplied are:

– 3 m PVC-hose 10 x 16 fitting threaded hose coupling and hose nozzle (two pieces).
– 3 m PVC-hose 8 x 14 fitting reducing adapter 3/4" to 1/2" (two pieces), union nut 1/2" with hose nozzle (two pieces), flat seal (two pieces).

3. Installation

3.1. Preparations For Installation

Do not carry out any unauthorised conversions or modifications to the recycled water cooling unit.

- Any dirt trap in the cooling water connection of the turbomolecular pump (if fitted) should be removed.
- Where transportable systems are involved, the recycled water cooling unit must be anchored to the base.
- Owing to the heat which is generated, the recycled water cooling unit should not be positioned in the vicinity of working places.
- Air ducts to conduct away hot air must not be blocked.
- The recycled water cooling unit must not be positioned in the vicinity of a heat source (radiator).

Do not block air inlets and outlets.
Keep clearance of at least 300 mm.

3.2. Fitting The Recycled Water Cooling Unit

Cooling water inlets and outlets can be connected to turbomolecular pumps as required.

TZK 400
The connections of the TZK 400 have an female thread of 3/8".

The scope of supply please refer to Section 2.3..

Insulated hoses or pipes must be laid where greater distances between the recycled water cooling unit and the turbomolecular pump are involved.

➡ Seal and turn the required hose nozzles into the cooling water unit.
➡ Connect the respective PVC hose; hose clamps are unnecessary.

TZK 2000
The connections of the TZK 400 have an female thread of 3/4".

Scope of supply please refer to Section 2.3..

Insulated hoses or pipes must be laid where greater distances between the recycled water cooling unit and the turbomolecular pump are involved.

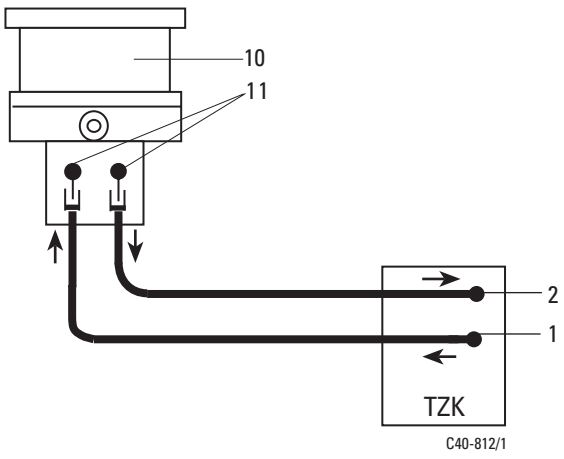
➡ Screw in the required connecting set to the Resycled Water Cooling Unit TZK 2000.

In case of use the reducing adapter 3/4" to 1/2" the connection at the recycled water cooling unit must be sealed.

➡ Connect the required PVC hose to the hose nozzle on the recycled cooling water unit; hose clamps are unnecessary.

Establishing the cooling water circuit

1 Water outlet
2 Water inlet
10 Turbomolecular pump
11 Cooling water connection



3.3. Electrical Connections

Electrical connections must be carried out in complaince with local regulations.

The recycled water cooling unit is supplied with a 2.5 meter long cable with mains plug.

➡ Plug into AC mains 230 V / 50 Hz.
➡ Where a TZK is connected to a Pfeiffer Vacuum turbomolecular pump the wiring diagram of the turbomolecular pump is applicable.

4. Operations

4.1. Filling Up With Cooling Water

(Please refer to figure under Section 2.1. Main Features)

TZK 400

➡ If necessary, switch off the system during the time of filling up with cooling water.
➡ Remove the water return line from the turbo pump.
➡ Fill up the liquid container in the TZK 400 with cooling water via the water inlet (water filler port) 2 up to the marker on the water level display 4.
➡ Re-connect the water return line to the turbo pump.

TZK 2000

➡ Fill up the liquid container in the TZK 2000 with cooling water via the water filler port 3 (3/4") up to the marker on the water level display 4.

4.2. Setting The Cooling Temperature

On delivery, the recycled water cooling unit has been set at the optimum temperature for operations with a Pfeiffer Vacuum turbomolecular pump; this setting should not be changed.

4.3. Switching ON And OFF

➡ The recycled water cooling unit is switched on and off via the ON/OFF switch 7.

5. What To Do In Case Of Breakdowns?

It is not allowed to work on the recycled water cooling unit cooling circuit or electrics; such repairs may only be carried out by Pfeiffer Vacuum Service.

Problem	Possible cause	Remedy
Winding protection in the cooling compressor trips	• Impermissible overpressure in coolant circuit from: – too high ambient temperature	• Check air supply, reduce ambient tempe rature
	– defective fan	• Arrange repair with Pfeiffer Vacuum Service
	– Insufficient air circulation owing to dirty condenser or	• Clean condenser blades with compressed air brush (or the like)
Winding protection in fan motor trips	• Bearing damage	• Arrange repair with Pfeiffer Vacuum Service
	• Blocked rotor	• Arrange repair with Pfeiffer Vacuum Service

6. Maintenance

Recycled water cooling unit maintenance is concerned with the following:

➡ Checking the cooling water level and cleanliness.
➡ Keeping the condenser blades clean.

7. Service

Do Make Use Of Our Service Facilities
In the event that repairs are necessary a number of options are available to you to ensure any system down time is kept to a minimum:
– Have the unit repaired on the spot by Pfeiffer Vacuum Service;
– Return the unit to the manufacturer for repairs;

Local Pfeiffer Vacuum representatives can provide full details.

Repair orders are carried out according to our general conditions of sale and supply. If repairs are necessary, please send the unit to your nearest Pfeiffer Vacuum Service Center.

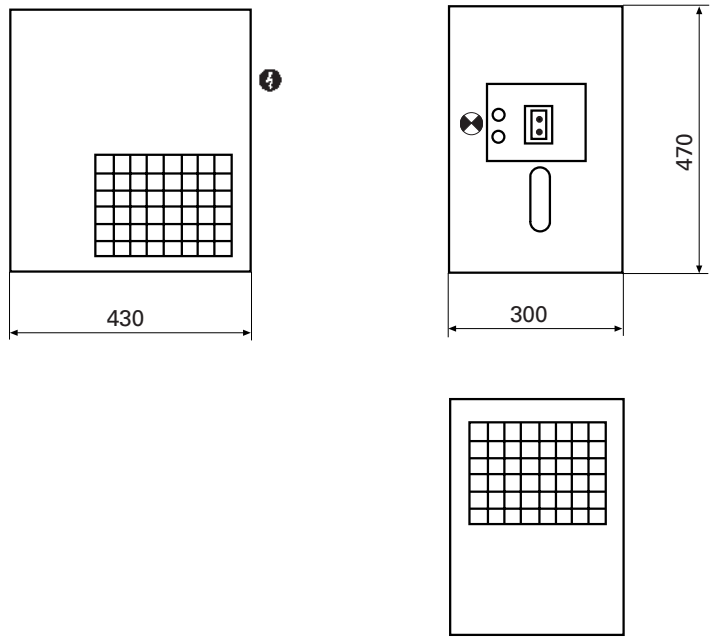
Contact Addresses And Telephone Hotline
Contact addresses and telephone numbers can be found on the back cover of these operating instructions.

8. Tecnical Data

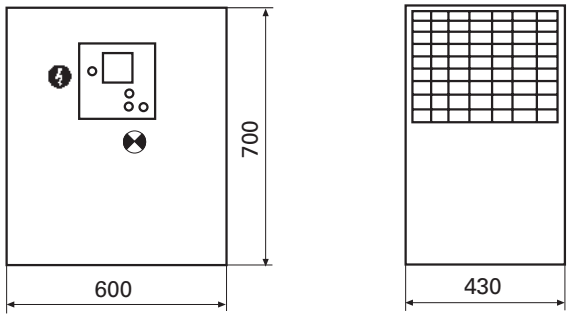
Feature	Unit	TZK 400	TZK 2000
Cooling performance at 20 °C water outlet temperature and 24 °C ambient temperature	W	540	1800
Works setting			
In	°C	11,5	11,5
Out	°C	16,5	16,5
Max. ambient temperature	°C	32	32
Cooling water filling	l	3,8	50
Cooling water flow rate at 2m pressure height	m^3/h	0,45	0,3
Max. power take-up	W	370	960
Connection voltage	V/Hz	230/50	230/50
Weight without water	kg	30	71,5
Coolant		R 134 a, FCKW-frei	
Noise leve	dB(A)	57	66

8.1. Dimensions

TZK 400



TZK 2000



PFEIFFER VACUUM

Konformitätserklärung
Declaration of Conformity

im Sinne folgender EU-Richtlinien:
pursuant to the following EU directives:

- **Maschinen/*Machinery* 98/37/EG (Anhang/*Annex* IIA)**
- **Elektromagnetische Verträglichkeit/*Electromagnetic Compatibility* 89/336/EWG**
- **Niederspannung/*Low Voltage* 73/23/EWG**
- **Druckgeräterichtlinie/*EC-Pressure Equipment-Directive* 97/23/EG**

Hiermit erklären wir, dass das unten aufgeführte Produkt den Bestimmungen der **EU-Maschinenrichtlinie 98/37/EG**, der **EU-Richtlinie über Elektromagnetische Verträglichkeit 89/336/EWG**, der **EU-Niederspannungsrichtlinie 73/23/EWG** und der **Druckgeräterichtlinie 97/23/EG** entspricht.

*We hereby certify, that the product specified below is in accordance with the provision of **EU Machinery Directive 98/37/EEC, EU Electromagentic Compatibility Directive 89/336/EEC**, **EU Low Voltage Directive 73/23/EEC** and **EC-Pressure-Directive 97/23/EEC**.*

Produkt/*Product:*

TZK 400

TZK 2000

Angewendete Richtlinien, harmonisierte Normen und angewendete nationale Normen:

Guidelines, harmonised standards, national standards which have been applied:

EN 292; EN 294; EN 378;
EN 50081; EN 50082; EN 55014;
EN 60204 Teil 1; EN 60335; EN 60555;
IEC 801;

DIN 8975; DIN 31001; DIN 45635 Teil 35;
UVV- VBG 20; 9. GSGV

Unterschrift/*Signature:*

Pfeiffer Vacuum GmbH
Berliner Str. 43
35614 Asslar
Germany

(W. Dondorf)
Geschäftsführer
Managing Director

Konf.I/2003

Your Vacuum Technology Experts in

Turbo Pumps

Rotary Vane Vacuum Pumps

Roots Pumps

Dry Vacuum Pumps

Leak Test Units

Valves

Flanges, Feedthroughs

Vacuum Measurement

Gas Analysis

System Technology

Service

PFEIFFER VACUUM

Pfeiffer Vacuum Technology AG · Headquarters/Germany
Tel. +49-(0) 64 41-8 02-0 · Fax +49-(0) 64 41-8 02-2 02 · info@pfeiffer-vacuum.de · www.pfeiffer-vacuum.net